

Fruiting relations of some Mycetozoa

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Biological literature is rich in studies of the mycetozoa, or the so-called slime molds. Accounts of their life histories and habits are to be found in zoological as well as in botanical publications, since some zoologists maintain that these organisms should be classed with the protozoa. Most of the literature, however, is found in botanical papers, and as Arthur Lister has pointed out, their study has usually been associated with that of fungi. The term "mycetozoa," which is descriptive of the principal characteristics of these organisms, was introduced by DeBary (1860) as a designation for the group.

The present report is intended merely as a brief note on the substrata on which some of these myxomycetes are found when fruiting in the field. Therefore a complete review of the mycetozoan literature is unnecessary. For a resumé of the literature concerning these organisms the reader is referred to A. Lister's monograph (1925).

Usually when authors describing slime molds have mentioned the type of substratum on which the fruiting structures are found, they have been content to describe it merely as dead wood, dead leaves, or dead herbaceous stems; or they have used some other terse phrase equally indefinite. In some instances the description has been more specific in that the kind of wood or leaf is mentioned. Possibly in some cases there is a definite association between the fruiting condition of a slime mold and a particular species of wood or leaf. Observations in the field, indicate, however, that for many species of mycetozoa the texture of the substratum on which they fruit is more constant than the species of the substratum. This would seem to indicate that the moisture content of the substratum, rather than the species, determines whether or not a particular location is suitable for the fruiting of a given myxomycete. For example, some species of the elegant *Stemonitis* apparently require a situation which is not too wet. They are found most frequently in more or less exposed situations, raised somewhat above ground level, and therefore not exceedingly wet. The writer has found *Stemonitis fusca* on bare rock, on bracket fungi, and on fairly dry pieces

of wood; *Stemonitis ferruginea* has been found on dry leaves of oak and beech and on moderately dry dead twigs of hemlock. These forms, when ready to fruit, appear to seek not some particular species of wood or leaf but rather some particular conditions, probably of moisture and possibly of light also.

Gulielma Lister's brief accounts (1922, 1926) of the mycetoza collected on two trips of the British Mycological Society, Hadden's (1921) record of mycetoza at Porlock, and Hagelstein's (1929, 1930) short notes give one some idea of the moisture conditions and of the texture of the substrata on which the specimens were found. Such descriptive accounts of the substrata, however, are not numerous.

There may well be a more or less close connection between vegetative stages of different species of mycetoza and specific kinds of wood or leaves on which they occur, since it is entirely conceivable that different species may differ in their nutritional requirements. But such seems not to be the case with the sporangia. *Didymium nigripes*, *Leocarpus fragilis*, *Hemitrichia vesparium*, and *Arcyria denudata* are forms which are very constant in the moisture conditions of the substrata on which they occur, but each of these forms appears on a variety of species. The first three species seem to prefer relatively sound tissues, while the last one is found on less sound tissues and frequently on wood which has disintegrated so much that it is almost earth. This indicates that either the moisture requirement or the moisture tolerance of *Arcyria denudata* is higher than that of the other forms mentioned.

Most general accounts of the life histories of mycetoza state that at the time of sporangium formation the plasmodium seeks the light and a comparatively dry situation. These two requisites are manifestly unimportant for some forms, since their sporangia are frequently situated in the interior of rotting logs where obviously the light conditions, and in all probability the moisture content, do not change appreciably during the time required to complete the life cycle. At least one species of *Lampoproderma* (*L. violaceum*) and at least one species of *Hemitrichia* (*H. serpula*) are sometimes found in such situations. On the other hand, a large number of forms seem to require different conditions for fruiting and for vegetative activities. Apparently very different conditions of moisture are tolerated by various

mycetozoa in the sporangial stage. Most of the common species of this region can be placed in one of three groups, as follows:

Group I.¹ Forms with sporangia which occur mostly on relatively firm to hard and sound wood or dry leaves (including needles of gymnosperms) or both, indicating that they require relatively dry situations.

Group II.¹ Forms with sporangia which occur mostly on relatively soft to disintegrating wood or wet decaying leaves (including needles of gymnosperms) or both, indicating a preference for, or a tolerance of, situations somewhat wetter than those of group I.

Group III. Forms with sporangia which seem to be equally tolerant of either situation and occur about equally distributed on both types of substratum.

These groups seem to be, for the most part, fairly definite and constant. Occasionally, however, an exception is noted and a form which commonly appears in situations characteristic of group I is found in one characteristic of group II and vice versa.

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¹ Only wood and foliar structures are listed, as they are by far the most common substrata. Stones, moderately dry nut shells, moss plants, bracket fungi, herbaceous stems, etc., should be included in group I; wet mosses, decaying nut shells, bracket fungi, herbaceous stems, etc., should be included in group II.